

Flare Safety Awareness

August 2010 Safety
Second Topic of the Month

Overview

- What is a Flare
- Hydro Area Flare Configuration
- D&R Area Flare Configuration
- What is Thermal Radiation or Radiant Energy
- Procedures
- Signs

What is a Flare



A flares primary purpose is to act as a safety device to protect vessels or pipes from over-pressuring due to unplanned upsets.

It allows safe depressuring of process equipment and safe burning of unprocessed hydrocarbons before releasing to the atmosphere.

The size, brightness, and heat of the resulting flame depend upon how much flammable material was processed.

Richmond Refinery has 7 Flares

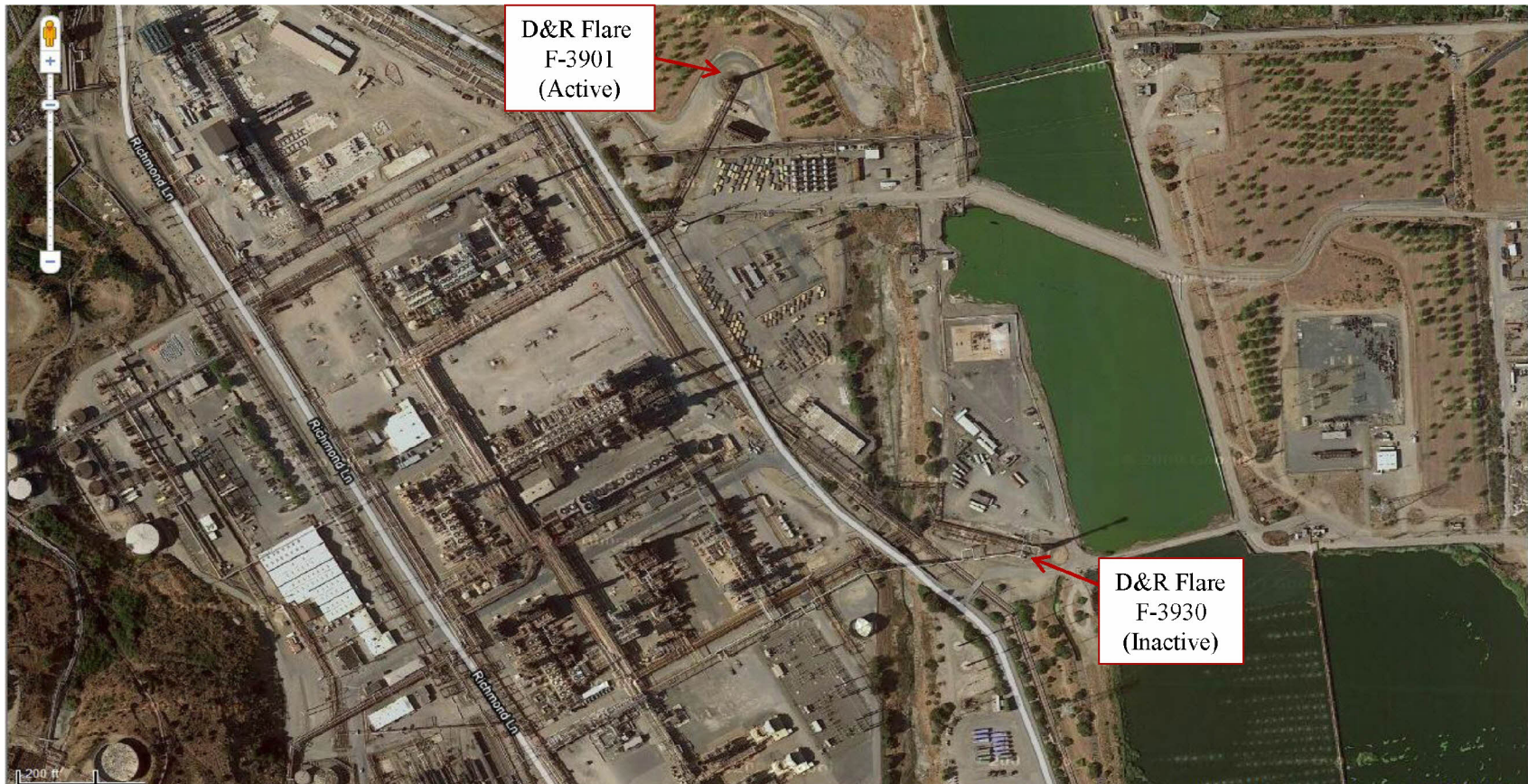


5 Flares in the Hydro Area



2 Flares in the D&R Area

Current 1 active and 1 inactive



What is Thermal Radiation or Radiant Energy

Also known as HEAT.

The effect of HEAT depends on:

1. Distance to the source.
2. Length of exposure.
3. Available shielding.

Example: A sunburn depends on:

- How intense the sun (UV and IR) is during direct exposure.
- How long you are under the sun.
- Available sun protection such as suntan lotion.



Radiant Heat Effects

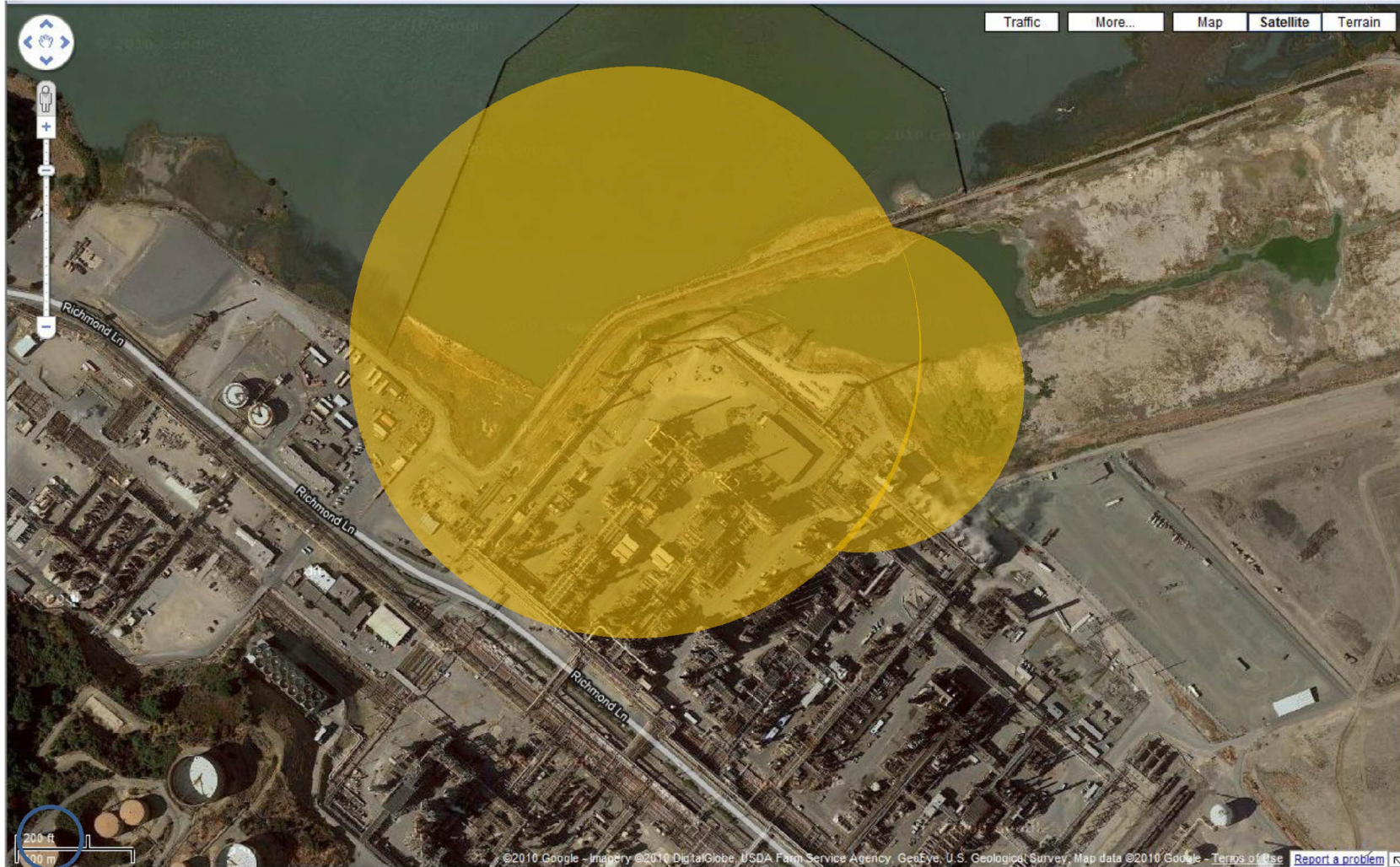
Item	Intensity (Btu/ft ² -hr)	Comment
Solar radiation	320	Hot summer day.
Continuous exposure with appropriate clothing¹	500	API-521 guideline
Maximum where emergency action lasting 2 to 3 minutes can occur with appropriate clothing¹ and no shielding (API-521 guideline)	1500	Time-to-pain threshold on bare skin is 16 seconds. Mild sun burn quickly follows. The burn progresses to a severe sunburn and then followed by more serious tissue damage with further exposure.
Maximum where urgent emergency action may occur. Shielding and/or additional PPE maybe required (API-521 guideline)	3000	Time-to-pain threshold on bare skin is 6 seconds. Mild sun burn quickly follows. The burn progresses to a severe sunburn and then followed by more serious tissue damage with further exposure.
Plastic material	4000	Begin to melt
Cotton clothing	12,800	Ignites in a few seconds.

1. Appropriate clothing consists of hard hat, long-sleeved shirts with cuffs buttoned, work gloves, long-legged pants and work shoes.

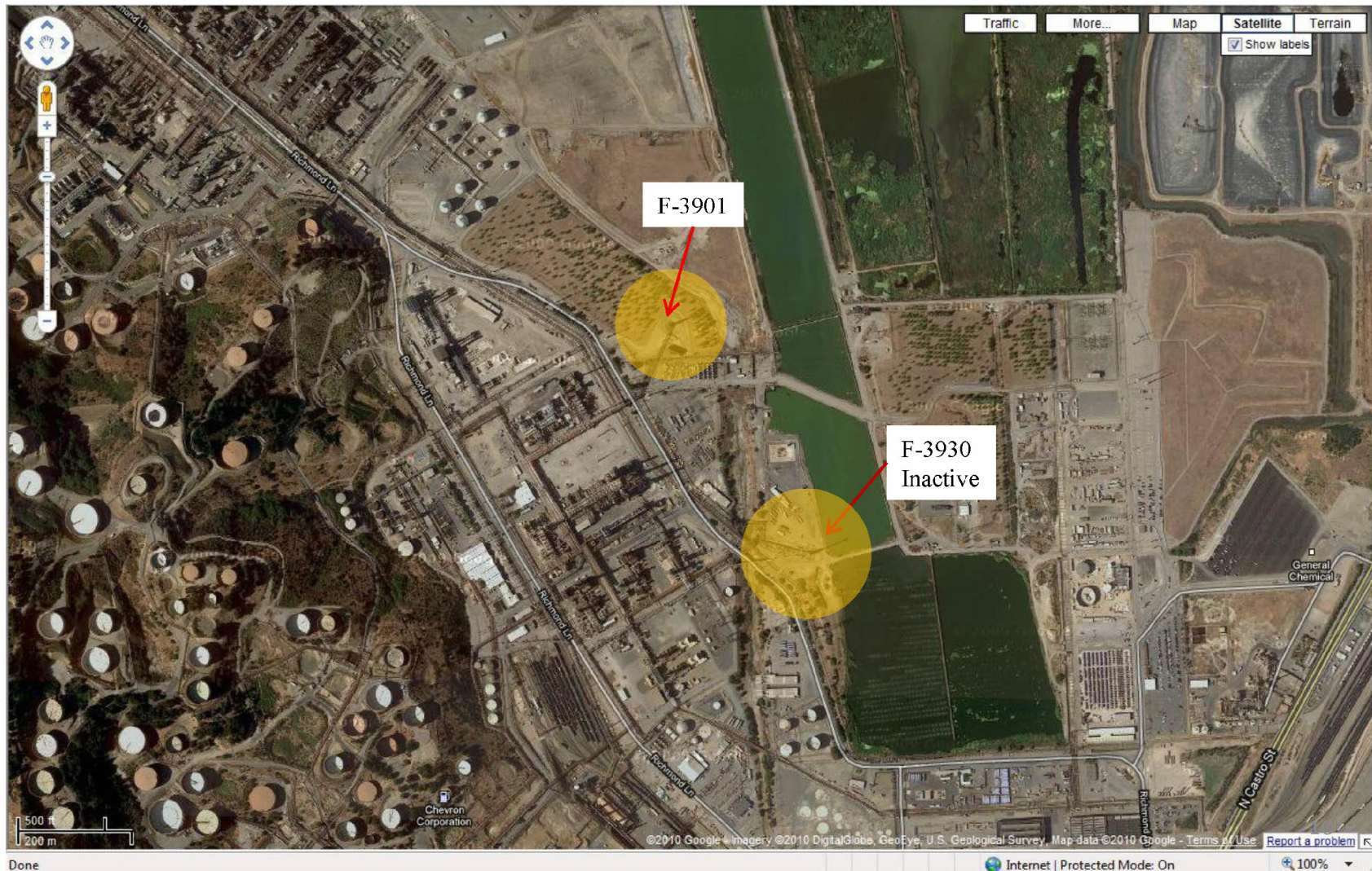
Flare Heat Safety Awareness

- A flare heat safety zone is being established at ground level around the flares at 1500 Btu/ft²-hr and above (based on the worse flaring scenario).
- Markers/signs will be placed near the edge of the flare heat safety zone.
- Signage at the Hydro, EOD and D&R Control Rooms sign-in areas to alert entrant to complete the required flare heat safety awareness training before allowed to enter.

Flare Heat Affected Zone - Hydro and Cracking
Yellow Area – 1500 Btu/ft²-hr or above.
Move to designated areas during a flare event



Flare Heat Affected Zone – D&R
Yellow Area – Yellow Area – 1500 Btu/ft²-hr or above.
Move to designated areas during a flare event



Safety Procedure

- If personnel in flare heat safety zone notice the flare flame and noise ramping up, move quickly away from all flares and go to the designated evacuation areas or outside of flare heat safety zone. Use shielded route, if available, such as under piping and behind vessels.
- Personnel should stay away from the flare line-of-sight. (E.g. behind structures, inside building, etc.)

Sign Placement

- Flare Heat Safety Zone signs will be placed on:
 - Approach walkways and roads
 - Major Vessels or Operating Areas

Heat Warning Sign in Field

NOTICE

Flare Heat Safety Zone

Potential High Heat Area during Flaring

Evacuate to Designated Areas during Flaring

Personnel entering this zone shall have flare heat safety training. Do not enter if you have no training.

Heat Warning Sign in D&R, Hydro, and U&E Control Room

WARNING!

DO NOT ENTER FLARE HEAT SAFETY
ZONE WITHOUT FLARE HEAT
SAFETY TRAINING.

Flare Heat Safety Training Record

Training Date: _____

Name	Signature	Name	Signature	Name	Signature

For Chevron personnel, Please send a copy of this training record to Diane Vodenik (2-8273)

Questions

- Contact Steve Brown, Field Safety Coord if you have any questions- ext 1745 or at sezn@chevron.com